their number to ten. At present the number of persons renting wires is a little more than 1000, and the average number of messages a little more than five a day for each.

M. MAREY has asked the Paris Municipal Council for the grant of a space of 1200 metres in the Park of the Champ de Mars for establishing a zoological station; but such a large space could not be afforded without inconvenience to foot-passengers, so he has accepted the grant of a space which was tendered to him at Passy, in the Park of Princes.

THE Congrès archéologique of France holds its forty-eighth session at Vannes (Morbihan) on June 28. Among other subjects to be discussed are the megalithic monuments of the Gulf of Morbihan, the chronology of sepultures, influence of soil on the distribution of megalithic monuments, bronze objects and other remains found in tombs of Brittany, Gallic and Roman coins, ante-Roman remains in Brittany.

TWENTY shocks of earthquake were reported from Szt. Ivan Zelina and Blazedotoc (Hungary) between May 20 and June 7. Some rather severe shocks also occurred on June 11 and 12, direction north-east to south-west.

THE Caucasian Museum at Tiflis is fast approaching completion under the active and energetic direction of Dr. Radde. The visitors from Western Europe, who are expected at the Archæological Congress, will already find a tolerably numerous collection of natural history objects and archæological specimens.

THE discoveries of remains of palæolithic man in Russia continue to be most interesting. Recently M. Shaposhnikoff discovered a great quantity of stone implements in the district of Valdaï, where a forest has been cut down and the wind has denudated the sand of the subsoil. The implements belong to four categories: (1) knives and saws similar to those of Moustier, St. Acheul, and Solutre, more perfect than any found previously; (2) the same in miniature, most accurate, and made of the finest kind of flint; they might have been used as ornaments, or for tattooing; (3) figures of animals and men made in flint, and relief pictures of the same, also in flint; (4) ornamental designs on stone. The collection is very rich, especially in miniature implements.

A LITTLE book just published by the Kössling'sche Buchhandlung (Gustav Wolf) of Leipzig is named "Naturwissenschaftlich-mathematisches Vademecum," being an alphabetical and systematic compilation of all modern publications in the domains of natural sciences and mathematics.

AT the meeting of the South-Eastern Railway Company the other day Sir Edward Watkin announced the complete success of the preliminary borings of the Channel Tunnel, and the resolution of his own Company on this side and the French Company on the other to make a further important step. A gallery seven feet in diameter has already been driven from the shaft near Abbots' Cliff for half a mile towards France, and an agreement has been made to push forward a similar headway under the sea for a mile on each side of the Channel. At the present rate of progress this will probably be done within the next six months, and then it is expected that the further nine miles on each side will be undertaken at once. All the conditions seem favourable to the project. The soil is found to be exactly similar at both ends. It is, as was expected, grey chalk impervious to water; and there is every reason to anticipate that it will be found to stretch in an unbroken bed across the Channel. Last week the machinery excavated sixty-seven yards of lineal distance, equal to about two miles a year. At this rate the two headways might meet under the middle of the Channel in about five years; and probably a nearly equal period might be occupied in enlarging this mere seven-feet burrow to a capacious railway tunnel.

IT is proposed in Edinburgh to make a three months' trial of lighting Princes Street and the North Bridge as far as the Tron Church with the electric light, on the Brush system.

BIRMINGHAM has resolved to invite the British Association to hold their annual meeting for 1883 in that town.

THE last number of the *Journal de Physique* describes a set of registering electrometers and magnetometers which are being tried at the Collège de France. The magnetic bars and the apparatus generally are very small. The instruments have been invented by M. Mascart, who believes they will give trustworthy results, and will compare favourably with the large magnetometers used in Kew and other places.

THE past winter cold in Norway, between October, 1880, and March, 1881, has exceeded the normal mean by 7° C. The greatest cold yet registered at any of the Norwegian meteorological stations occurred between January 13 and 15. At Karasjok, the lowest temperature was observed on February 4, when the thermometer fell to – 50°·6 C., the lowest ever noted in Norway with trustworthy instruments.

A WORK on the Butterflies of Europe, illustrated and described by Dr. Henry Charles Lang, F.L.S., will shortly be published in about twenty monthly parts. It will give accurate coloured figures of all the species of Rhopalocera found in Europe, showing both the upper and under side where necessary, as well as the differences of sex, if requiring a separate figure; and the most important of the named varieties will, when possible, be also represented. Typical illustrations of larvæ and pupæ will from time to time appear. The figures will be drawn from specimens in the author's collection. The description of a species will, whenever possible, include a notice of its transformation, habitat, and times of appearance, along with the principal synonyms and necessary references. The arrangement and nomenclature will be mainly those of Dr. Standinger's well-known catalogue. Each part will contain four coloured plates and sixteen pages of letterpress. The cost is very moderate. The publishers are Messrs. Reeve and Co., of Henrietta Street, Covent Garden.

THE additions to the Zoological Society's Gardens during the past week include a Chacma Baboon (*Cynocephalus porcarius*) from South Africa, presented by Mr. Thornburgh-Cropper; four Harvest Mice (*Mus minutus*), British, presented by Mr. Henry Laver; a Banded Grass Finch (*Poëphila cincta*) from Queensland; two Yellow-bellied Liothrix (*Liothrix luteus*) from India, presented by Mrs. Hylton Joliffe; a Red-legged Partridge (*Caccabis rufa*), European, presented by Mr. Arthur Morrell, School Ship *Cornwall*; a Horrid Rattlesnake (*Crotalus horridus*) from Bahia, presented by Dr. A. Stradling, C.M.Z.S.; a Patas Monkey (*Cercopithecus ruber*) from West Africa, a Blue Jay (*Cyanocitta cristata*) from North America, purchased; a Rhesus Monkey (*Macacus erythræus*), a Cape Buffalo (*Bubalus caffer*), born in the Gardens; seven Australian Wild Ducks (*Anas superciliosa*), five Chiloe Widgeons (*Mareca chiloensis*), a Mandarin Duck (*Aix galericulata*), two Geoffroy's Doves (*Peristera geoffroii*), two Turquoisine Parrakeets (*Euphema pulchella*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN

THE SOLAR PARALLAX.—At the sitting of the Paris Academy of Sciences on the 6th inst. M. Tisserand communicated a note received from Mr. Todd of the office of the *American Ephemeris* at Washington, giving the value of the solar parallax deduced from the photographic operations of the American expeditions, as detailed in the "General Discussion of Results," a volume which has just been issued. The number of photographs is 213, distributed over various stations thus:—

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Northern Hemisphere.	
Wladiwostok	13
Nagasaki	45
Pekin	26

Southern Hemisphere.	
Kerguelen	8
Hobart Town	37
Campbelltown	32
Queenstown	45
Chatham Island ...	7

Putting dA for the correction of the difference of R.A. between the Sun and Venus, dD for the correction of the difference of declination, and $d\pi$ for that of the assumed value of the parallax (8″·848) the solution of the equations of condition corresponding to the distances gives—

$$dA = +1''{\cdot}181 \ \ldots \ dD = +2''{\cdot}225 \ \ldots \ d\pi = +0''{\cdot}0397 \pm 0''{\cdot}0418.$$

Similarly from the equations corresponding to angles of position there result—

$$dA = +1''{\cdot}109 \ \ldots \ dD = +0''{\cdot}637 \ \ldots \ d\pi = +0''{\cdot}0252 \pm 0''{\cdot}0595.$$

Combining these values, the final results become—

$$dA = +0^{s}{\cdot}076 \ \ldots \ dD = +2''{\cdot}083 \ \ldots \ d\pi = +0''{\cdot}035 \pm 0''{\cdot}034,$$

and the corrected value of the solar parallax is thus 8″·883. It will be seen that the magnitudes of the probable errors are very large in proportion to the corrections obtained.

BIELA'S COMET IN 1805.—Those who have acquainted themselves with the history of this remarkable comet will remember that at its appearance towards the end of 1805 it was last observed in Europe by Thulis at Marseilles on the evening of December 9, at which time it was at its least distance from the earth, and was moving rapidly southwards. The comet was then visible to the naked eye, and it was known that it would probably continue so for some days, and might attract attention in the other hemisphere. But there was no southern observatory in existence at that time. Prof. Hubbard, in his masterly investigation on the motion of Biela's comet, remarked how greatly observations taken in the southern hemisphere at this appearance might have contributed to the progress of the theory of the comet. Gauss was then applying his methods for the determination of elliptic orbits, or rather of orbits without the assumption of a particular conic section, and it could hardly have happened that with good southern observations the nature of this comet's orbit would not have been detected from the observations of 1805, and the comet might thus have been re-observed in 1812, if not in 1819.

Up to a quite recent date it was not known that the comet had been observed in the other hemisphere, but Prof. Winnecke has discovered (where he does not say) some observations made at the Mauritius by MM. Malavois and Dupeloux on December 14 and 15. They were brought to light while he was inquiring into the periodicity of the comet detected at Strassburg by Dr. Hartwig on September 29, 1880, and he gives an account of them in the last number of the *Vierteljahrsschrift der Astronomischen Gesellschaft*. They are entitled "Observations sur la Comète qui a paru à l'Ile de France dans le cours de frimaire au 14^e^ par M. Malavois et M. Dupeloux." M. Malavois states that he was apprised of the appearance of the comet on the morning of December 14. Four days previously (and therefore the day after it was last seen in Europe) it had been detected by MM. Laprie and Dabadie, the one a censor, the other a professor of the colonial Lycée: they had remarked that it had passed in a very short interval "over the space between the constellations Grus and Pavo, moving almost from north to south." On the evening of December 14 Malavois "avec un excellent sextant à lunettes d'un pied de rayon," measured the distance of the comet from Achernar and Canopus, and the distance between the stars, and Prof. Winnecke has been at the trouble to reduce these observations accurately, and to compare them with Hubbard's elements with the aid of an ephemeris calculated therefrom by Herr Kaufmann. Referring to the above-mentioned periodical for particulars, we may say that Hubbard's orbit is found to place the comet too much to the west by 13′ in right ascension, and in declination one minute to the north. But while giving these differences between calculation and observation, Prof. Winnecke only aims at proving that Biela's comet was recognised in the southern hemisphere, and well observed, considering the means available.

The description of the comet's appearance given by Malavois is worthy of particular remark:—"Cette comète est photosphèrique, c. à d. entourée d'une sphère lumineuse dont le diamètre m'a semblé être en totalité d'environ 45 minutes: mais la partie la plus lumineuse, ou l'auréole vue au commencement du crépuscule du soir n'étoit guère, que de 20 à 25 minutes; on la distinguoit alors très bien, tandis qu'à peine on pouvoit apercevoir les étoiles de 7^{me} grandeur. La comète vue avec une lunette qui grossit seize fois le diamètre des objets m'a paru divisée en deux par une petite band obscure; j'ai jugé son diamètre apparent d'environ une minute, mais les bords m'ont semblé confusément terminés et se foudre avec la lumière nébuleuse; une étoile de 4^{e} à 5^{e} grandeur que je distinguais très bien dans l'auréole à 4 ou 5 minutes de la comète, s'est trouvée dans une position et une distance différente par rapport à cet astre dont le mouvement propre étoit en effet considérable, comme on la voir." Malavois' observations were limited to the evening of December 14, absence preventing his observing it on the following night, and clouds interfering on December 16 and 17; and he adds: "les jours suivans j'ai cessé de l'apercevoir."

Prof. Winnecke draws attention to the remarkable appearance of the comet under a power of 16, in the evidently small telescope, and asks: "Can we recognise in the 'petite bande obscure,' which divided the head into two parts, the commencement of the action which led to the highly important result, that in 1846 and 1852, instead of a single comet, two were observed, and later the comet has been no longer visible as such." In connection with the Mauritius observation it must be remembered that the aspect of the comet was particularly noted on December 8, when it was nearer to the earth than on December 14, by Olbers, Bessel, and Gauss, who agree in their description: on the same evening it was examined and measured by Schroeter with powerful reflecting telescopes at Lilienthal. Neither observer has any reference to the appearance of a division in the head of the comet on that date. Olbers says "it had a small but very distinctly defined nucleus, surrounded by an extensive nebulosity, without any appearance of a tail." The comet was visible to the naked eye with the brightness of a star of the third or fourth magnitude, and could be well seen after the moon had risen. Schroeter noted that without the telescope it appeared nearly as large as the moon: in his 13- and 15-feet reflectors it was apparently much diminished, his measures giving a diameter of only 5½ minutes: the diameter of the brightest part of the nucleus he found to be 4″·05, and that of the whole nucleus 6″·42; if a division had existed at the date of these measures it is hardly probable that it would have been overlooked by Schroeter. At the reappearance of the comet in 1826, and again in 1832, nothing of the kind was remarked. Hubbard, we know, considered that the division of the comet, from whatever cause it might be produced, took place at the end of the year 1844.

GEOGRAPHICAL NOTES

THE hydrographical expedition for the exploration of the mouth of the Obi River has started from St. Petersburg. It consists of four officers of the navy, one astronomer, M. Fuss, and two students of the St. Petersburg University, one of whom is a surgeon and the other a zoologist. Two small steamboats were sent to Perm, on the Kama River, and they will be transported to the Obi.

HERR SIEGFRIED LANGER of Vienna is about to undertake an exploring tour in Arabia under the auspices of the Vienna Geographical Society. His researches will be mainly of a linguistic nature, but scientific research is not excluded from his programme; he has prepared himself for the tour during the last few years at the Vienna University.

THE geographical department of the British Museum during the past year was deprived of the services of its able curator, Mr. R. H. Major, through ill-health, and on his retirement the opportunity was taken to reduce it to a sub-department. If we may judge by the newly published report of the British Museum, this change has not tended to increase activity in geographical matters, and among the most interesting acquisitions of the past year all that can be mentioned seem to be some old plans of towns and the like.

IN the last volume of Consular Reports S. de Zuccato at Venice furnishes an interesting map showing the lines proposed and in course of construction for the completion of the network of railways in Venetia. M. Consul Bernal also contributes a plan of the Havre docks.

IT is announced that the Portuguese travellers, Capello and Joens, are about to publish an account of their expedition under the title of "De Benguella as terras d'Iacca." The work will be

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